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EDITED BY WILLIAM HUNTING, F.R.C.V.S.

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PARASITOLOGY.

Perhaps neither medical men nor veterinary surgeons have ever given this subject quite the attention it deserves. Cobbold, who was doing pioneer work upon both human and animal parasites half a century ago, found it difficult to awaken his own generation to the importance of the subject. In some respects conditions have improved; for there is now no lack of appreciation of the importance of parasitology amongst pathologists, and the general standard of knowledge of the subject is certainly far higher than it was. But the advance of our knowledge of the grosser animal parasites is far from keeping pace with our advances in the more recent studies of bacteriology and protozoology.

Our knowledge is advancing by leaps and bounds with regard to organisms which are recent discoveries, and which can only be studied by the aid of oil immersion lenses. But with regard to these other organisms, some at least of which have been known for generations and can be seen by the naked eye, our knowledge remains almost stationary. Every practitioner, even one possessing the most average acquaintance with the latter subjects, could name many points upon which more knowledge is required. The life-histories and powers of adaptability of acari, for instance, are still insufficiently understood; the life-cycles of many helminths are absolutely unknown.

There are a host of such problems still awaiting elucidation, and probably no more difficult than many similar ones which were solved decades ago by aid of the comparatively simple scientific apparatus of the older investigators.

The bulk of the research work done in our laboratories is either bacteriological or protozoological. No one who studies a manual of protozoology, remembering that practically the whole of it is the outcome of the last fifteen years, will belittle the merit of that work. But any general practitioner who aspires to engage in it, even if he has the apparatus for doing so, will soon recognise that he has neither the time nor the facilities. Why is it, then, that so few practitioners think of taking up the practical study of this simpler subject of parasitology, for which most practices provide ample material, and which certainly demands little outlay in apparatus. It does demand patience, ingenuity, and a taste for practical biology.

A FRACTURED FEMUR.

A fortnight ago I was called to see a four-year-old harness horse that had fallen into a ditch in the field, and had probably been there all night. When got out, he was very lame on the near hind leg; the stifle was very much swollen, and appeared to be the seat of the lameness. After two or three days treatment the swelling was reduced, and the animal seemed to be going on satisfactorily.

On next visiting the patient I found a small swelling just above and behind the hip joint, and on makling the horse walk, there was a very distinct clicking sound, I informed the owner that there was a fracture, with displacement at the top of the thigh bone. The animal was destroyed, when the femur was found to be fractured just below the head of the bone which was left in its place in the acetabulum. This is, I should imagine a very uucommon fracture in the horse.

A. JOHNS, M.R.C.V.S.

Kimbolton, Hunts.

CUTANEOUS TUBERCULOSIS IN A PIG.

Kurtwig (*Zeitschrift für Fleisch und Milch Hygiene*) records the following peculiar lesions observed at the abattoir. The subject was a young sow, in poor condition, which, after slaughter, was found to present all the signs of a recent generalisation of tuberculosis by the blood stream, lesions being found in the lungs, liver, intestine, spleen, kidneys, tarsal gland, bones, and pharynx. In addition, the skin in the cervical region showed very extensive lesions, bearing sixteen to eighteen ulcers which attained, at the most, the size of a small pea. These ulcers were shallow, with perpendicular walls, and were foul and fissured at the base. Between them the palpating finger very clearly ascertained the presence of numerous tubercles ranging from the size of a pea to that of a hazel nut. Upon incision the subcutaneous connective tissue and the underlying adipose tissue were found to be literally crammed with tubercles; and it was evidently the most superficial of these that had finally perforated the skin and given rise to the ulcers in question. The inferior cervical muscles and the glandular organs of the region were also considerably affected.

The author remarks that cutaneous tuberculosis of the pig is not, to his knowledge, mentioned in veterinary literature, which only reports similar cases in the ox, dog, cat, fowl, and parrot.

Fernereiszen, however, in his description of three cases of muscular tuberculosis in the pig, mentions lesions of the subcutaneous connective tissue.—*Annales de Med Vet.*

The Place of Predilection of the Cysticercus Tenuicollis in the Liver of the Sheep.

The *Cysticercus tenuicollis*, the cysticercal form of the *Tænia marginata*, is frequently found in the sheep. In adult animals (those of nine months and more) it is situated in the peritoneum, in the region of the epiploon, mesentery, diaphragm, and liver. In lambs (less than nine months old) the same organs may be involved; but in them the cysticercus is little larger than a pea and is usually degenerated and surrounded by a strong membrane of connective tissue, while calcareous deposits are also often present. The liver alone is an exception to this; and practically it may be said that the liver is the only organ commonly involved in the case of lambs. Sometimes the liver is invaded very early—even before seven weeks old.

Bergman (*Zeitschrift für Fleisch und Milch hygiene*) describes these hepatic lesions. The parasite, in its peregrinations through the invaded liver, forms narrow passages of a greenish or yellowish appearance, with brownish-red centres. These are easy to recognise when they exist superficially under the hepatic peritoneum, but their recognition becomes much more difficult when the channels are situated partially or wholly buried in the depths of the hepatic tissue. It is useful, in these latter cases, to know that the *Cysticercus tenuicollis* has a predilection for localising itself in one particular portion of the liver, viz., the region known anatomically as the *fossa venæ umbilicalis*.

This fossa is an infundibuliform depression of the inferior border of the liver; by which, in the fœtus, the umbilical vein penetrates into the organ. At birth all that portion of the umbilical vein which is situated outside the liver becomes obliterated; but a segment persists within the liver, and terminates in a *cul-de-sac* at the base of the infundibulum in question. This is the place where the parasitic cysts develope.

The parasite may be situated superficially or deeply. When situated underneath the serous layer, the cyst, while the parasite is still living, is voluminous and projects from the inferior border of the liver; but when the parasite dies the cyst becomes reduced in volume, and is sometimes only represented by a white irregular calcareous mass.

When the cysts are situated in the depth of the hepatic tissue, they are generally smaller in size, as they degenerate early. Their presence is rarely revealed by the existence of visible parasitic channels in the hepatic tissue; but they are nevertheless easy to discover. All that is necessary is to incise the inferior border of the liver at the fossa venæ umbilicalis, when the cysts, if present, will be found. Often the remains of dead cysticerci are found, in the form of calcareous lumps contained in a strong greenish calcified capsule. This capsule is surrounded by a lardaceous layer of connective tissue about 4-10ths of an inch thick, which in turn is surrounded by a thin hyperæmic zone of hepatic tissue.

A knowledge of this local predilection of the Cysticercus tenincollis is, as Bergman points out, of importance in meat inspeciion. A liver which is very parasitic or burrowed by numerous parasitic channels should not be passed for food. And, if the superficial lesions are only slight, it is none the less necessary for the inspector to assure himself that parasites are not abundant in the depth of the liver. He can do this by incising at the fossa venæ umbilicalis, the place of predilection of the parasites; and if nothing is to be found there, he may be certain that the rest of the liver either contains no lesions or, at most, only insignificant ones. —*Annales de Méd. Vét.*

W. R. C.

Extracts from Annual Report of Veterinary Officer Investigating Camel Diseases for year ending 31st March, 1910.

(*Concluded from p. 124.*)

Filaria Evansi.—The following is a brief summary of the results of investigations made to date :—

The adult filariæ are white worms from 3 to 9 inches in length and live in the lumen of the blood vessels, particularly the arteries; the females discharge the embryos direct into the circulation. Adults are occasionally found in extra-vascular positions. Of the arteries, the spermatic is the usual situation in which adults are found; next the pulmonary artery; and they may also be found in various other arteries of the viscera.

The embryos are found in the circulating blood and are easily demonstrated on examination of the fresh blood taken from the tip of the ear; the objective should be of low power, a two-third or a Zeiss A. The preparation must be a thick one, far thicker than that used in the diagnosis of surra. The embryos resemble a snake in shape and show violent movements of wriggling, coiling and uncoiling. Their length is about ten times that of a trypanosome.

In infected camels the embryos may be demonstrated on any day at any time of the year. They may also be found without difficulty at any hour of the day; they are sometimes more numerous at one hour than another, but this "periodicity" is not regular and in many cases the number of embryos in the blood appears to be about the same throughout the day.

When filarial embryos are found in the blood of a camel in poor condition, they cannot be blamed as a cause of disease until it has been shown that the animal is not suffering from the chronic form of surra.

When throughout the day, filarial embryos are so few that they can only be found after considerable searching, they do not cause any loss of condition and the animal appears quite healthy.

When, however, the embryos are in large numbers (say 50 or more in each 5 c.mm. of blood, or several in each field of a thick blood-film under a two-third objective) there are enough to cause loss of condition. Of a number of camels with filariasis only a small minority will show the embryos in such large numbers.

Surra and filariasis are often found in the same camel. This has greatly complicated the investigation of the latter disease.

A camel sometimes shows an insignificant number of filarial embryos for months and years in its blood and remains in perfect condition; sometimes, however, the number suddenly increases until they are very numerous

and in these cases a loss of condition has soon been apparent; during the increase the temperature is slightly above normal. I have seen no other constant symptom of a severe infection with *F. evansi* except loss of condition and strength, and its consequences; the duration of the disease therefore depends entirely on the conditions under which the animal is kept, and may run into many years. Loss of condition predisposes to other diseases.

I have found camels in which no embryos could be discovered in the blood, but which on post-mortem showed dead degenerating adults in the spermatic arteries and no living ones could be found anywhere; these were apparently cases of natural recovery. On the other hand, several severe cases have been under observation for long periods (one for 2½ years) but still show embryos in their blood, and remain in miserable condition.

It has been found that in the Punjab, *Filaria evansi* is practically (and I believe wholly) confined to camels which have spent part of their lives in those parts of India west of the Indus. Large numbers were infected in the Mohmand Expedition. I have examined hundreds of camels in investigating this point, and have found (i) a large proportion of camels from the Trans-Indus territory harbouring the worm, (ii) no case of filariasis in a camel which has been bred and reared East of the Indus at a distance sufficient to ensure its never having been across the river, and (iii) in spite of the high proportion of filariasis in camels returning from the Mohmand Expedition in June, 1908, there has been no case found to date (two years) of the infection having spread to remount camels from the east of the Indus. I conclude that the unknown agent which spreads the infection is confined to places in Trans-Indus territory. For the same reasons, it is unlikely that the transfer of the embryos from one camel to another is mechanical or it would have been spread from the expedition camels by the Punjab Tabanidæ.

The most likely explanation of the spread of filariasis is that the embryo is removed from the circulation by some blood-sucking intermediary host in which it undergoes some developmental process and then regains a camel either by the proboscis of its intermediary host as in human filariasis or by its excretion into the water-supply. Some preliminary observations seems to exclude the *Hippobosca camelina* from suspicion although that fly appears to be confined to parts of the Trans-Indus.

A number of drugs have been tried in the treatment of seriously affected cases; these include salts of antimony, mercury and strychnine, and also atoxyl, soamin, and chloroform, but none have given a good result; castration, to remove some of the adult filariæ has been tried but the operation is very unsatisfactory when practised on camels in poor condition, and in most cases, adults are also found in other situations besides the artery of the testicle and so remain unaffected by the operation.

Having been asked to advise preventive measures against filariasis in the absence of exact knowledge of the agent of infection, I suggested :—

For camels east of the Indus no preventive measures are necessary.

For those west of Indus (i) in the cold weather when possible, water the camels from wells or water the filaria camels from a separate source than the healthy, or downstream of them; (ii) in the hot weather, in addition, segregate the filaria cases and do not let the healthy share the same grazing area as the filaria camels.

Surra is a far more important disease than filariasis and probably the necessary precautions against the former will prevent the spread of the latter to a great extent. A detailed account is being prepared of Camel-Filariasis.

Filariæ of the Eye.—This is a new parasite and was found on 15th May, 1909, in the vitreous chamber of the eye of a camel and was the apparent cause of the ophthalmia which affected the eye. The parasite was sent to Professor Raillet, of Alfort Veterinary College, France, who kindly examined it and reported it to be a new species which he has named *Thelazia leesei*, and which he considered to belong to the same group as *Thelazia lachrymalis* (better known as Filaria lachrymalis) of the ox.

Therefore we have since kept a look out for the parasite under the eyelids of camels (which is probably their normal habitat) and have found three more cases.

Of the 15 specimens found only 4 were males; the length of the males was 12 *mm.* and the females vary from 10 to 21 *mm.* They are very difficult to see *in situ* and have probably been often overlooked.

One case was found in the dry hot weather and three in the cold weather, so the parasite is probably not seasonal.

Its presence does not necessarily cause conjunctivitis; the same has been noticed with regard to the analogous parasites of horse and ox. In these animals, when conjunctivitis is set up, the worms are got rid of mechanically by raising the eyelids and haw and syringing underneath them with weak boracic acid solution.

Other Parasites. *Tænia centripunctata*—(in small intestine)—and *Distoma lanceolatum* (in bile-duct) neither previously noted in the one-humped camel have been met with this year. *Onchocerca fasciata* (Raillet) has been found to be fairly common coiled up in nodules in subcutaneous tissue. Out of a total of 100 post-mortems ordinary liver-flukes (*D. hepaticum*) have only been found twice; and Lingatula tænioides larvæ on only one occasion, in the mesenteric glands.

None of these parasites caused any perceptible harm to their hosts.

Kapaulee.—Under this name several different surgical diseases of the camels' head are in reality included. These conditions have been studied clinically for the last two years and are here briefly described. [These are: Simple subcutaneous abscess: Dislocation of eyeball from inflammation in orbital cavity, (*a*) septic infection from the lathi-wound; (*b*) abscess behind eye: Discharge of pus from the ear: Pus in the frontal sinus.]

A. S. LEESE, I.C.V.D.
Officer Investigating Camel Diseases.

Lahore, 22nd March.

A review by Inspector-General, Civil Veterinary Department, is appended, which concludes :—"Mr. Leese has continued to devote himself whole-heartedly to his work in very trying and unhealthy conditions, and I consider that he deserves great credit for the progress which he has made during the year.

H. T. PEASE, Col., Inspector-General, C.V.D.

Simla, 19th May.

THE NORTH OF IRELAND VETERINARY MEDICAL ASSOCIATION.

A general meeting was held at their rooms, "Deveney Chambers," North Street, Belfast, on Wednesday, 20th July, at 7 p.m. The following members were present: Messrs. F. W. Emery, F.R.C.V.S., President, in the chair; J. A. Thompson, J.P., Treasurer; J. J. Ross, J. Gregg, J. McLean, W. Dawson, A. M. Creighton, A. S. Anderson, Howard McConnell, W. Watson, F. R. McRoberts, J. McClure Barry, Robert Thompson, H. D. Gilmore, and J. A. Jordan, Secretary.

The following wrote expressing their inability to be present: Messrs. Robert Kernohan, J.P., John Kernohan, J. Kyle, G. D. Taylor, J. Howatt, and Gordon Stewart.

The PRESIDENT said that before proceeding with the agenda he wished to say that since their last meeting the country had suffered a great loss in the death of His Majesty King Edward VII. It was impossible to find words to say how deeply His Majesty was enshrined in the hearts of his people, but they were very happily expressed by Queen Alexandra when she said they had "lost a King, a friend, and a father." (Hear, hear). Conjointly with his friend Mr. Jordan, he had sent letters of sympathy the Queen Alexandra, King George, and Queen Mary, and had received gracious acknowledgments in reply.

The minutes of the previous meeting were unanimously taken as read and signed by the President.

NEW MEMBER.

Mr. JAMES PURDY, Portal Inspector, Drogheda, was unanimously elected a member of the Association.

REPORT OF COUNCIL.

The HON. SEC. submitted the following:

Mr. President and Gentlemen,—The only business before your Council since our last meeting was to consider what further steps, if any, should be taken with regard to the action of the Dungannon Show Committee. They decided that a copy of the resolution adopted at our May meeting should be forwarded to the Chairman of each of the County Councils in Ireland, the Secretaries of the Veterinary Associations in Ireland, and to the Secretary of the Department of Agriculture and Technical Instruction for Ireland, accompanied by the following letter of explanation:

"The North of Ireland V.M.A.
July, 1910.

Sir,—I have the honour to forward the copy of a resolution passed by my Association at a recent meeting and to request you to be so good as to place it before your Council.

As my Association are desirous of securing the approval and support of your Council in this matter, it is perhaps desirable that I should briefly explain our position. In the first place, allow me to say that we are not actuated by any spirit of antagonism to the Dungannon or other Agricultural Society, nor is the motive a selfish one, as veterinary assistance at such functions is given gratuitously. Moreover, should our views be followed and a sounder stock produced, the result could hardly be claimed as tending to our pecuniary advantage. But from the unique position that members of the veterinary profession hold throughout the country they are in a position to form a correct estimate of the value or otherwise of such institutions and we have been forced into the conclusion that unless freedom from disease and soundness are taken as the first principles in the promotion of animal exhibits, they will be entirely devoid of educational value or utility, and as a matter of fact do more harm than good.

Our stock have now a world-wide reputation, and we feel that we would have failed in our duty to our fellow countrymen if we had refrained from directing their attention to a matter which if persisted in would ultimately result in much loss to Ireland's reputation and wealth.—I have the honour to be, sir, your obedient servant,

(Signed) JAMES A. JORDAN, Hon. Sec."

CORRESPONDENCE.

The SECRETARY read a letter received from the Veterinary Medical Association of Ireland *re* appointment of a veterinary surgeon to the staff of the Local Goverment Board. When he (the Hon. Sec.) was requested to communicate with the Secretary of above Association drawing his attention to a resolution adopted by us at our meeting in May last.

A letter was also read from Mr. Gofton asking a contribution towards the expenses incurred in promoting the proposed Amalgamation Scheme. It was resolved to refer the matter to Council.

Messrs. J. McKee and Co's account for window screens and Messrs. Aiken and Jordan's account for printing were passed for payment.

The PRESIDENT said it required no words from him to introduce Prof. Dewar, whose distinguished abilities they all knew. He promised them that they were about to enjoy an intellectual treat. (App.) Prof. Dewar was most cordially received, and expressed his pleasure at renewing old acquaintanceships in Belfast.

REDWATER.

By Principal J. R. U. DEWAR.

When your late President, my old friend, Mr. Thompsom, Lurgan, wrote to me the other week and suggested that I might come across to Belfast to a meeting of your Association, that I would have an opportunity of renewing old acquaintances and strengthening old friendships, and at the same time might make a few remarks on some professional subject, I felt glad to comply if I could; so I asked him to suggest some subject that he thought might prove interesting. He kindly gave me a choice of three: Pneumonia: Obscure forms of lameness in horses: and Redwater.

I confess that I was perhaps helped to a decision by the fact that about that time I received a leaflet issued by our British Board of Agriculture entitled "Redwater in cattle (Bovine piroplasmosis)."

There was no hesitation in that designation, no misgiving, no doubt whatsoever. While not prepared to accept the inference implied in the title given to the leaflet, I was only inclined to express the opinion that the designation given was still "sub-judice," rather than say it was wrong; to ask whether at the present time the verdict should not be one of "not proven." The rate of progress in modern pathology, has been so rapid, so surprising, especially in the etiology of disease as due to micro-organisms, that we must remember the knowledge that most of the diseases known as Redwater are due to piroplasma, only dates back about 20 years.

The disease itself has been known in Britain as Redwater, Blackwater, Darn, and Muir ill since before there was a veterinary College in the country. It is known nearly all over the world, the name—Redwater being very common, but is also called Hæmoglobinæmia, Hæmoglobinuria, Bovine malaria, Tick fever, Tristeza, etc.

It seems to have first been recognised as a dangerous, and very fatal disease, then believed to be contagious in the United States more than 100 years ago. A Dr. Mease recorded the fact of a herd of cattle conveying the disease from South Carolina into Pennsylvania in 1796. But it was in 1868 that Texas cattle shipped up the Mississippi conveyed the disease, and were the cause of enormous losses in Illinois and Indiana during that summer. Hence the name—Texas fever or Southern cattle fever, and from that time the disease demanded and received more attention from the United States authorities. So great was the alarm caused by it that a quarantine line was fixed across half the continent, over which cattle could only be removed under the strictest regulations.

Time went on, and while knowledge of the disease became more accnrate it also became more mysterious, until in 1889 Messrs. Smith and Kilborne of the United States Bureau of Animal Industry began their researches into the nature of the disease, and that same year discovered the presence of parasites in the red blood

corpuscles, and also concluded that the presence of ticks was in some way necessary to the spread of the disease.

The results of their investigations were published in the reports of the Bureau for 1891-92, and have become classical. No better work or better report in connection with the investigation into the nature of any disease has, I believe, ever been published. Their conclusions were at once almost unanimously accepted throughout the world. But it was not till 1901 that the late Prof. Nocard demonstrated the presence of the piroplasms in Ireland, in 1902 the late Mr. Warwick in Cumberland, and in 1904 Mr. Montgomery in Devonshire. And only yesterday, in the Highland Society's showyard at Dumfries, Mr. Wm. Brown, Banchory, told me that he had demonstrated the presence of the parasite in the blood of a patient affected with "Darn" at Brathens, Banchory, Kincardineshire, strange to say, a place which the late Prof. Gamgee mentioned as being badly affected with the disease when he was conducting investigations into it.

Etiology.

The disease is due then to the presenee of these parasites in the blood—called by their discoverers the piroplasma bigeminum—as they believed that their most typical form was two somewhat pear-shaped bodies in a corpuscle. Notwithstanding the rapidity with which they seem to destroy the corpuscles, they may not appear to be very numerous on microscopic examination of the blood. An animal may be very ill of the disease, and yet the parasites not be found in the blood on examination, sometimes only about 1 in 200, while 3 per cent. is a full average number of the corpuscles to be affected. There are also rounded and oval forms, smaller, isolated, or 1 to 4 in a corpuscle.

The ox alone is susceptible to the disease, and calves are but slightly susceptible and will survive, experimentally, a dose of virulent blood which would rapidly kill an adult animal. One attack confers some immunity—more toleration than immunity—and never complete. But animals born and bred in Redwater districts are mostly immune. Texas cattle, born and reared in Texas, seldom die of Texas fever. This is ascribed to repeated tick inoculations when young, followed by abortive infections, but animals removed from these localities lose their immunity in two or three years. That is, animals in Redwater districts, and animals recovered from an attack of the disease, carry the parasites in their blood, and their blood remains virulent often for more than two years.

The American experimenters proved that the disease was not directly contagious by actual contact, nor is it transmitted by the excreta or secretions of affected animals; they failed to convey it by the blood and pulped viscera of animals that had died of the disease, smeared on to pasture on which healthy susceptible animals were grazing. They found that the disease was only communicated from animal to animal by means of ticks. The tick which was found to be the common transmitter of the disease in the States is termed the *Biophilus bovis*. But as the disease is met with nearly all over the world it is found to be conveyed mostly by different ticks in the different countries. In Britain it is said by our Board of Agriculture veterinary officers to be the *Hæmophysalis punctata* and the *Ixodes ricinus*—often called the common dog tick. In France the *Ixodes reduvius*, and in South Africa, South America, and in Australia different ticks in each.

Smith and Kilborne found that Texas cattle, or cattle that had recovered from Redwater, although in apparent health, would contaminate a pasture where the disease had never been known before, if there were ticks on the cattle or on the pasture. The cattle carried the parasites in their blood, the ticks sucked the blood, and an adult ovigerous tick would then drop off and lay eggs to the number of about 2,000, from which the young ticks as larvæ hatch out.

Now it is strange that the adult ticks, if after sucking on an affected animal, are put on to a susceptible animal, do not communicate the disease. In the United States disease it is apparently the young larval ticks alone which convey it; larvæ, the progeny of a mature tick that has sucked blood from an animal carrying the parasites in its blood. But in Britain, according to our Board of Agriculture, it is in the nymphæ stage that the tick conveys the disease. It seems an extraordinary circumstance this. With our limited intelligence we think we might understand how an adult tick sucking blood from an affected animal and then getting on to a susceptible animal and biting or boring a wound in the skin might, as it were, inoculate that animal, but for the progeny of the tick which sucked the infected blood, to be the means of communicating the disease is almost beyond our comprehension. What transformations the parasite of Redwater—the piroplasm—goes through in its passage through the tick can scarcely be guessed at.

After affected animals carrying ticks have grazed on a pasture, it usually takes from six to eight weeks before susceptible animals, although put on to the pasture immediately the diseased ones are removed, manifest any symptoms of the disease. That is, it takes that time for a generation of ticks to mature. But although Smith and Kilborne believe there may be a new generation of ticks about every two months or a little more, they estimate the life of a young larval tick in grass, especially if the grass is not too dry, at very much longer than this. Nocard estimated it at more than seven months, Theiler and Stockman in South Africa at six months at least, but in Australia it is believed to be shorter, not over three months in a dry season.

I should mention that the disease cannot be communicated by ingestion of virulent blood, but is easily communicated by inoculation either subcutaneously or intravenously, and is usually easily communicated to a susceptible animal by blood from an animal in a Redwater district, or from an animal that has recovered from an attack of the disease.

Semeiology.

Most observers describe it as occurring in two forms, acute or malignant, and subacute or benign.

In the acute form it manifests itself suddenly—dullness, depression, loss of appetite and rumination, thirst, constipation, high temperature—all authorities are agreed about the high temperature, frequent pulse and respiration, secretion of milk arrested, and a flow of saliva, but dry muzzle. There is a high temperature before manifest symptoms are present, and it tends to remit, to be lower in the morning than at night. It usually falls below the normal before either death or recovery takes place. The constipation often gives way to a watery diarrhœa, which may be rusty or chocolate-coloured, with some tenesmus. The mucous membranes at first highly injected become pale and anæmic, or of a yellowish tint. Then the colour of the urine, although not constant, has given the name Redwater to the disease. The colour is present in ¾ to 4-5ths of acute cases. It becomes tinted pink, port wine colour, then claret, reddish brown, or even as black as porter. It seldom contains corpuscles or solid matter in suspension, but contains hæmoglobin, and usually from 1 to 3 per cent. of albumen. Emaciation and exhaustion are rapid, the animal can scarcely stand, there are tremblings, the temperature falls below normal, and the animal often dies struggling for breath.

Although rare, nervous symptoms are sometimes present, some paraplegia, amaurosis, or complete blindness, even delirium or frenzy, or it may turn round and round like a sheep with sturdy.

UMI

Subacute or Benign.—This form is most common in calves and young animals, but in the United States is common in adults in the autumn, and is believed to often pass unnoticed. There is generally some remittent fever, more frequent and stronger heart beats, and often albumen in, but no discolouration of, the urine. Relapses are usually of this type, but are sometimes acute, and may and do occur without reinfection. The appearance of the parasite is different, it is not pear shaped but round or spherical in form, and while in the acute form there may be only from less than 1 to 2 or 3 per cent. of the corpuscles affected, in this form there may be from 5 to 50 affected in the circulating blood, more in the spleen, still more in the liver, and as many as 80 or 90 per cent. in the kidneys.

That the blood is pale and watery is evident to the naked eye on making a prick or minute incision during life. The number of red corpuscles in the blood of healthy oxen varies from about seven millions per c.mm. in winter to about five millions in late summer and early autumn. But in the course of the disease they are rapidly reduced until the number is usually under two millions before death.

Smith and Kilborne found it oftener than once under 1,200,000. They give as the most characteristic features of the disease high temperature, hæmoglobinuria, and the thinness of the blood, and consider the latter—the destruction of the red corpuscles as the one essential character of Texas fever—Redwater.

When recovery is taking place the temperature falls, the urine clears, there is some return of the appetite, but convalescence is usually prolonged, the animal is weak, debilitated, anæmic, emaciated, and relapses are not uncommon.

Duration: The fever is seldom prolonged beyond eight or ten days, but an animal may die weeks after from sheer exhaustion.

Diagnosis: The most diagnostic symptoms are the high temperature, the coloured urine, and the pale watery condition of the blood. Mild cases can only be suspected in Red Water districts when others in the herd have been affected, unless the blood is examined.

Prognosis depends mainly on the district, and the type of disease prevailing at the time. Sudden attacks are nearly always fatal.

Treatment.

Nearly every possible remedy has been tried for Red Water. Like white scour in calves, it has almost run the "gamut" of the pharmacopeia. Quinine, calomel, carbolic acid, lysol, have all had their votaries, and by most been discarded as useless. Krazerud recommended large injections—several pints of physiological serum. Intravenous injections of formol and protargol 1 per cent. repeated until the urine alters. Attention to hygiene and nursing is very important—sloppy foods, gruels, and mucilaginous drinks, fresh young grass if it can be had.

But all other methods of treatment have, meantime. been cast in the shade by the method introduced by Prof. Nuttall, of Cambridge University, and Dr. Hadwen, Veterinary Pathologist in the Department of Agriculture, Canada, in the treatment of canine piroplasmosis.

The medicament used is a recently introduced benzidine dye trypanblau, which has been put on the market in the form of a coarse dark violet, or nearly black powder. At first they recommended its use in saturated solution. It is not very soluble, and the saturated solution is generally nearer two than three per cent. dissolved in boiling water. With more experience it is thought that a weaker solution even one per cent. may be sufficiently strong. An allied dye—trypan red has also been tried but does not appear to be nearly so efficacious.

Although they used doses of from 100 to 200 c.c. of a saturated watery solution injected intravenously without observing any injurious effect from the drug, and state that it appears to produce no ill effects on cattle, yet they now consider that much smaller doses are equally efficient, and owing to its small solubility it is much more easily managed in 1 or even 1½ per cent. solution. Trypanblau seems to have little if any effect when given by the mouth, and they consider that given intravenously it acts more rapidly and satisfactorily than when given subcutaneously. It colours the animal's tissues blue, but how long this staining may remain is not yet known. Trypanblau should not be kept in solution, but dissolved as required for use.

There is no necessity for me to dwell on the care required in the preparation, manipulation, and administration of the drug, to make sure that everything is thoroughly clean and aseptic. If the intravenous injection is scarcely so simple as giving it by the mouth, or even subcutaneously, it is not very much trouble, as a single dose seems quite sufficient. In fact, although there has not been so much experience with it in bovine as in canine piroplasmosis, it is found that in the latter, if a first dose does has not had the desired effect, a second dose does not seem to do any good.

This trypanblau treatment has been favourably reported on by other experimenters—see Walter Jowett, in *The Cape Agricultural Journal*, November, 1909, and Sydney Dodd, experimenting in Queensland, Australia, in *The Veterinary Journal* for the current month, July, 1910.

If they have not already done so I hope those gentlemen who are practising in Redwater districts—and Redwater districts are always districts in which there is a good deal of broken and uncultivated land and rough pasture—will give this method of treatment a fair trial, and publish the results for the benefit of their profession and their country.

Prophylaxis.

The usual police methods can be applied, but with much greater difficulty, than with other contagious diseases, as recovered animals or animals from a Redwater district remain centres of danger for a long time. It may not be possible to tell, even after microscopic examination of the blood, whether an animal is dangerous or not, *i.e.* whether it harbours the parasite. And it is certainly not possible to tell by an examination of the ticks whether they are infective or not. The most efficient preventive is the cultivation of the land, improved farming. Where there is no waste land, no rough pasture, where the grass is never more than two or three years old, there is no Redwater. There are practically no ticks. Land badly infested with ticks can be temporarily cleaned by burning the pastures, but if the adjoining pastures are also infested it will soon be as bad as ever. Dipping the animals to destroy the ticks is also recommended, but dipping does not always destroy them—a tick has at least as many lives as a cat.

Our Board of Agriculture recommend that sheep and cattle should be pastured together, as they believe that the sheep will collect the majority of the ticks, the animals are not susceptible to the disease, and can be frequently dipped to destroy the ticks adhering to them.

There is no dressing known so obnoxious to the tick as to keep them off the animals for any reasonable time.

Immunization.—We have seen that animals reared in Redwater districts acquire a natural immunity—it is thought owing to repeated abortive attacks—but it is not a real immunity as they carry the parasites in their blood, render ticks that feed on them infective, and they in turn communicate the disease to susceptible cattle.

Yet a great deal has been done by the subcutaneous and intravenous injection of blood from recovered animals to give an efficient protection to animals not naturally protected. It has been tried in Australia,

South Africa, and South America without a safe and reliable method being yet available. In practice it is found that the virulence of infected blood differs materially, as does also the susceptibility of the animals meant to be protected. In the United States they use blood from calves reared in affected districts, and operate in the autumn when the disease is naturally much less severe.

But inoculation with infected blood is not without risk. In one case of which I got the details, 107 cattle mere inoculated and 17 of them died from the effects—from typical Redwater. Yet it has been largely used in some countries, as many as 35,000 cattle being inoculated in one season in Queensland with reasonably little loss.

Post-mortem appearances. Decomposition sets in rapidly, notwithstanding the anæmia; tissues may be normal in colour, but in protracted cases there is often icterus; lungs healthy as a rule, but sometimes œdematous; heart has a somewhat par-boiled appearance, in a delayed case often fatty; petechiæ and extravasations under the pericardium and endocardium, according to Nocard there are always hæmorrhages under the endocardium of the left ventricle; blood thin and watery, but not pale and does not brighten on exposure to the air, and the serum is always tinted. In the abdomen usually gelatinous effusions around the kidneys, in the hilus of the liver, stomach, pancreas, and duodenum; spleen always enlarged, often 2 to 4 times the normal, and firm; liver enlarged, congested, yellow, and mottled in the later stages, and may be fatty; gall bladder distended with thick greenish, often flakey bile; kidneys enlarged, congested, may be dotted with petechiæ and friable; there may be some ecchymoses in the bladder, and urine coloured according to the stage of the disease. Some observers describe lesions in the alimentary tract, congested appearance of the fourth stomach, and congestion and hyperæmia here and there all along the canal to the rectum.

Parturient Redwater.

I should like to refer briefly to what I believe to be another form of Redwater, if not so common, at least far more fatal in Scotland—I mean Parturient Redwater.

Some sixty or more years ago the late Mr. M. Cuming, veterinary surgeon, Ellon, Aberdeenshire, wrote an article on this form of Redwater which appeared in the Transactions of the Highland and Agricultural Society, and has been quoted by nearly every subsequent British writer of note, amongst them the late Professors Dick, Gamgee, and Williams.

Mr. Cuming distinguishes the different forms of the disease very clearly, and says "Under the generic name of 'Redwater' have been described by various practical authors, diseases essentially differing in their nature, their causes, and commonly in their terminations; in fact agreeing only in the colour of the urine voided during their continuance. In the hope of avoiding this error . . . . the following remarks are designed solely to refer to that form of Redwater known to occur in milk cows, and which generally follows within a short time after their calving. This disease, ... I shall take the liberty, for distinction's sake, of calling "Puerperal Redwater."

The late Mr. John Steele, veterinary surgeon, Biggar, one of Prof. Dick's earlier pupils, and later an examiner in Veterinary Surgery to the Highland and Agricultural Society, writing in *The Veterinarian* in 1834 says, referring to Redwater: "It was raging here last spring with great violence; the cows were seized with it about two weeks after calving in every case that I have seen except one." Referring to its occurring in districts, he says: "I know of one farmer that keeps 16 cows, and had 5 cases of it; another that keeps 12 had 5 cases; and a third that keeps 10 had 3 seized." Again, Mr. Steele enquires: "How is it to be explained that this disease should come on exactly two weeks after calving?"

That both forms of the disease were recognised even at this date is easily proved. Apart from Mr. Cumings' opening remarks, a Mr. G. Dawson, South Queensferry, writing in the same year—1834, says, "There is a field belonging to Lord Rosebery, in Dalmeny Park, kept in pasture for the cows, which has probably lain in grass for 60 or 70 years in which the disease occasionally appears. There is a great deal of rank, coarse grass in the field. The cows which have been bred on the farm are never affected with Red Water, but almost every cow which is bought in and put on this field is attacked with it in from three to five weeks."

In districts where the form of disease was common, which attacks both sexes indiscrimately when at pasture in summer, it was known as "The Darn," or "Muir Ill." In one district on Deeside, which is mentioned by Prof. Gamgee, it was considered a great recommendation to animals for sale in the market 50 or 70 years ago to be able to say that they were "Darn bred," i.e., bred in a Red Water district, so that the buyer could rely on it that they would not be attacked by the Darn—Red water. But I have said enough to show that where the parturient form of the disease seems to have been best known, the other form was clearly recognised.

Etiology of the Parturient form:— Mr. Cuming ascribed it to too exclusive feeding on turnips; to too much sugar in the food. Others to poisonous plants. One thing nearly always present, in my experience, was that it occurred on second and third rate farms, on farms with their soil inclined to moorland, or farms imperfectly drained. And we know that on farms where every spring it was a dreaded scourge it is now unknown. I have had blood films from affected cows frequently examined by competent microscopists, but without discovering any parasites in the blood corpuscles. Of course that is only negative evidence, but it is of some value. Perhaps it is better to say that the etiology is still unknown.

Semeiology:—There is no doubt it appears in varying forms in different districts, and while one practitioner finds it a comparatively simple affection, another will find it a serious and often fatal disease. I shall describe a pretty severe form. On farms where the disease is not a stranger it is looked for from the 8th to the 14th day after parturition, and the earlier it appears the more severe, as a rule, is the case. Three weeks after parturition the cow is considered safe.

The first thing usually observed is the urine frothing where it falls, or a heap of froth where the animal has been urinating. At this time nothing may have been observed wrong. But if not present now, in a few hours diarrhœa will be existent, and the fluid fæces come away in a very small stream, almost as if from the nozzle of a syringe, as if the anus was contracted. Pulse a little accelerated, strong and distinct, no fever, no rise in temperature, and at this stage no loss of appetite nor rumination.

By another day the appetite is less keen, rumination irregular, the diarrhœa may have given way to constipation, some diminution in the secretion of milk, and the pulse still more frequent and bounding. There may be some yellowness of the mucous membranes and of the skin in a light coloured animal, and the urine is now distinctly red and comes away in a small stream. There is also a distinct puckering of the anus and vulva, as if the discharges were irritating and causing contraction.

In another day the urine is almost black, rumination suspended, appetite almost gone, milk still in surprising amount, and when allowed to stand a reddish sediment usually settles at the bottom of the vessel. No fæces are passed, pulse 80 to 100, distinct and bounding. The ears and extremities may be cold, but still there is no rise in temperature, in fact it is often subnormal.

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Should the case become worse the urine is secreted in smaller quantities and in a very small stream, pulse still more frequent, and excited heart action, and milk is secreted in diminishing amount almost to the last, and is more likely to deposit a red sediment on settling.

The force of the hearts beats can scarcely be credited by one who has not seen the disease.

A V.S. writing in *The Veterinarian* for 1834 says "in some cases a violent palpitation comes on which can be heard at some yards distance."

Mr. McGillivray, v.s., Rayne, says "the heart beats strongly and may be heard at a little distance."

Mr. Tait, v.s., Portsoy—"Even standing a few yards from her, you could hear the heart beating as distinctly as if your ear had been laid against her side."

I have heard the heart beating distinctly twenty yards away from the animal, and it was not a few beats, as if she had been greatly startled, but it beat on steadily that way for from 24 to 36 hours.

Brain symptoms are sometimes manifested, and it is questionable if recovery ever takes place after these are distinct.

Necrosis of the extremities is not uncommon, most frequently the tail, next the tips of the ears, and then the digits. They first become swollen, hot and painful, the pain, heat, and swelling disappear in succession, the part shrinks, and dry gangrene is the form which it takes. The tail and digits are shed, but the ears shrivel up, and I have seen a tail hot, swollen, and painful regain its normal healthy condition.

Mr. Cuming, describing a case in detail, says—"But one of the hind feet never regained its circulation, and about a month afterwards the skin began to separate around the upper pastern joint, and in a short time the foot dropped off by the end of the shank bone."

Mr. McGillivray, in describing a case which occurred about the beginning of last century, in which he gives the owner's name and address, says—"She stood on the lower ends of the bare shank bones after her feet had disappeared by gangrene."

I once had a case in an Aberdeen Angus cow, regarding which I flattered myself that she was to recover. She was on a small farm at the edge of a moss. It was in the late spring and the fodder was scarce, so she was bedded with home-made moss litter. The black cow and the black litter corresponded pretty well, and she seemed to appreciate it, as she lay persistently and would not get up, although there was no appearance of paralysis. After about a fortnight I discovered that a line of demarcation had formed around each leg above the fetlock, and below the line all was cold and insensitive. It required considerable persuasion to get the owner to consent to have her destroyed, and I did not get a post-mortem examination.

When recovery is taking place I have seen the urine become almost milky in appearance.

Diagnosis.

The period of its occurrence, the colour of the urine, the diarrhœa, and the absence of fever, with frequent strong distinct pulse.

Prognosis.—Should always be guarded. The earlier it occurs after parturition the more sudden the onset; and the darker the urine at first the less favourable is the prognosis.

Duration.—From 24 hours. Should the cow live over the eighth day, with a fair amount of strength, and the urine becoming of a natural colour, recovery may be looked for.

Mortality.—I have known from 50 to 75 per cent.

Treatment.

The treatment recommended by most of the old writers was purgatives, and purgatives repeated.

It is a mistake. I used the orthodox treatment, and hastened the departure of a few, until I learned by experience.

If the case is seen early, before the diarrhœa has stopped, give an ordinary dose of purgative medicine, but not if there is distinct constipation—non-passage of fæces. Change the food while the animal is feeding, do not give turnips, and if on grass change it and give in smaller amount. Give artificial foods, cakes, meals, bran, draff, etc. After constipation has set in give oils in small quantities and stimulants. I used to give Ol. lini 6 to 8 oz., Ol. tereb. 1½ to 2 oz., usually 1 to 1½ oz. Laudanum to allay the irritation, and if there was much weakness often 1 oz. of Nitrous ether—all given together as a draught twice daily. And when the appetite was failing more stimulants—generally porter—and often raw eggs and milk. The animals generally got their own milk as long as it was worth giving.

Never mind the constipation. It does not kill. The bowels will come all right should the animal survive. I have had a patient not pass anything per anum for five days and live. Iron—extensively recommended—I never found of any benefit until convalescence was established.

Post-mortem appearances.—Body anæmic, but a general icterus; digestive organs generally healthy, but sometimes constipation of the omasum; liver enlarged, generally pale and friable; gall bladder full of thick dark bile; kidneys enlarged and sodden; bladder generally empty, but healthy, or may contain a little discoloured urine; what little blood is left is thin and has a peculiar lakey-red colour. But I have seen a big fat cow die within 24 hours of illness being noticed almost as anæmic as if she had been bled to death. It is doubtful if half a pint of blood could have been collected from the body.

Now to revert to our preliminary remarks. Is this only one disease? In other words, is Parturient Redwater a form of Bovine piroplasmosis?

Leaving the etiology at present, what are the symptoms? In piroplasmosis there is sudden dullness and depression, loss of appetite and rumination, thirst, constipation, high temperature, secretion of milk arrested, and a flow of saliva; the constipation often gives way to diarrhœa, and the high temperature is the first symptom should it happen to be taken.

In Parturient redwater, there is the regularity of its occurrence at a certain time after parturition, often after cows have been in the house for months; there is no rise in the temperature: the discolouration of the urine is the first symptom observed, and a diarrhœa which gives way to constipation; except in very acute cases the appetite and rumination may not be disturbed for from 24 to 48 hours, and the secretion of milk is continued. We must add to this that in severe and protracted cases gangrene of the extremities is common—a thing I have not seen referred to in piroplasmosis.

Then the autopsy of piroplasmosis indicates a specific infective disease; there is rapid decomposition; petechiæ; ecchymoses, and extravasations; gelatinous exudations into the cellular tissue around the abdominal organs, and the constant enlargement of the spleen.

In parturient red-water there are practically none of these lesions except anæmia and a change in the appearance of any blood left, the alterations in the liver and gall-bladder, the often sodden condition of the kidneys, and the general icterus.

Until the exact pathology of parturient red-water is worked out some doubt may remain, and if it is found in practice that trypanblau is a specific remedy for both forms of the disease, and cures both in a very similar manner, the presumption of the etiology of the diseases being the same would be greatly strengthened.

DISCUSSION.

Mr. J. A. THOMPSON, J.P., Lurgan, said they were under a great debt of gratitude to Prof. Dewar for his learned and interesting address. When he wrote asking him to come the Professor at once responded with his characteristic good nature. He (the speaker) did not live in what was known as a Redwater district—(laughter)—but as a matter of prevention he quite agreed with Prof. Dewar's remarks. He remembered some years ago when they had some old parks which were a source of constant trouble, but with the breaking up of demesnes Redwater had greatly disappeared. It was very interesting to hear of the new treatment and he hoped that those who lived in the Redwater districts would give it a fair trial and let the members have their experience. (Hear, hear.) He moved a hearty vote of thanks to Professor Dewar.

Mr. HOWARD MCCONNELL, Armagh, who seconded the motion, said in his district they were troubled with Redwater all the year round, not so much in the summer as in the winter, and they did not usually expect to have an outbreak till the end of August. He was taught that it was a disease of the poor man's kind, but in practical experience he found it was a rich man's disease as well, and he thought that Mr. Steel in his writings dwelt very strongly on that form of the disease. He said it was principally confined to calving cows and seldom seen in store cattle, but he (the speaker) had seen it in stores and had had many outbreaks in store cattle. The whole trouble he had experienced, however, was in milch cows. As the Professor had said, the effect of giving cows a physic when the bowels were constipated was such that they might as well shoot them as give them a heavy dose of medicine. In his district many people made the mistake of being led away by advertisements, and then when the animal was too far gone they called in the veterinary surgeon.

Mr. JOHN WATSON, Dungannon, after expressing great appreciation of the very valuable address, said that in some of the districts near him it was nearly all the young cattle that were affected by Redwater. He had very few cases of the puerperal form. He had known a case of a farm that had such a reputation for Redwater that it was left for years, and during that time it was cut for hay. Eventually a gentleman in town heard that a goat being placed on the pasture would prevent Redwater, that was tried and there had not been Redwater for the past few years. (A Member: It doesn't like the smell of the goat (laughter.) As to treatment he did not agree with physicking, but believed that stimulants was the right thing.

Mr. A. M. CREIGHTON, Lisburn, said there was no mistake that Redwater was a most destructive disease, and entailed an enormous loss in cattle in the country. It was generally a disease located in certain districts. In his district they would not get a case at all; in other districts they would find case after case. As Principal Dewar remarked, the places they generally found it were coarse herbage land that had not been cultivated, running semi-wild for a length of time, or near woods and marshes. The speaker detailed cases of farms which had been plagued with Redwater and the experience arising therefrom. With regard to the statement about cows being choked in drenching, his opinion was that in most cases where veterinary surgeons were called in the cow was emaciated and debilitated into a condition similar to that found in milk fever. The animal is in such a low condition that she hardly makes an effort to swallow, the result being that part of the medicine was not swallowed but lost in the throat, and some of it in the breathing was drawn down the trachea. With regard to the treatment of Redwater, it was a disease he condemned purgatives for, but there was no doubt people would come in and carry away drench after drench of physic, than which there was nothing worse they could give a cow. Anything they should give was oil along with stimulant and nutritious diets, sometimes gin was prescribed for it too.

Mr. W. DAWSON, Cavan, agreed with Prof. Dewar on nearly every point. He condemned oil entirely, but the main point was the choking. He always recommended physic. He agreed that where animals were bound stimulants should be used, and he always recommended them in such cases.

Mr. J. MCCLURE BARRY, Belfast, in supporting the motion, said as an old student of the Professor's it was a great pleasure to see him present. Anything he had to say was almost finality. (Applause.)

Mr. J. GREGG (Belfast) after expressing his pleasure at hearing the paper, said in reference to Redwatr he had not as much experience as some of the other speakers, but there appeared to be two forms—one the parturient arising from grazing on pasture in which cocksfoot was plentiful, and he had also known one or two cases which arose from fallen ash leaves in late autumn. There was no doubt there was also the tick form, and perhaps another form. As to choking, it occurred to him it might be due to an absence of mucus. He had never seen a case of necrosis, and did not remember of hearing of it in the North of Ireland.

Prof. DEWAR thanked them for the very flattering way in which they had referred to his efforts, but of course he remembered he was in Ireland. (Laughter.) He was exceedingly interested in Mr. McConnell's remarks about Redwater. It was quite evident it was as common and serious a matter in his district as in some districts he could remember, where it was not nearly so common now. Sometime, if not too busy, he would visit the district Mr. McConnell referred to. He had not seen any of it in the Lothians, and it was a long time since he had had personal experience of the disease. Mr. McConnell had said he had found it in store cattle. Did he find it as severe in young cattle as in the old ones? [Mr. McConnell: No.] I thought so! They would not get Redwater where they had close pasture; it was only when they had up-pasture or uncultivated land. He would offer a suggestion with regard to choking. If there was a flow of saliva they might expect there might be some mucus, but at the other end of the alimentary canal there were other contractions too. Was it not possible there might be some other contractions at the other end of the alimentary canal which were the cause of choking. He had found Redwater on farms that were so miserable and bare that you could find no shelter from one end to the other. Mr. Dawson had not found any difference. There was no reason why a recently calved cow should not be affected with the ordinary form of the disease. He always carried a thermometer, and he never met a temperature above the normal in the puerperal form in cows. He had no doubt that the great majority of cases of Redwater occurring in store cattle were due to piroplasmosis. They might have cattle which had been affected by the piroplasms ever so slightly, but they had them in their blood, and in that way other cattle became affected by them.

Mr. GREGG remarked that the paper of Prof. Dewar's would have a good effect on the veterinary surgeons present, and therefore through them on the public generally. (Applause).

Mr. A. M. CREIGHTON said they were all glad to have Prof. Dewar in the North of Ireland, and they hoped to soon have him back again. (Hear, hear).

The CHAIRMAN in putting the motion said he had prophesied that there was a treat in store for them, and that prophecy had come true. The paper was undoubtedly an excellent one and would take a great deal of study and thought before they could attempt any thing in the shape of criticism. (Hear, hear.)

The vote of thanks was enthusiastically passed.

Prof. DEWAR expressed his acknowledgment for the compliment, and for the kind hearing they had given him and the discussion that had followed.

It was decided to hold the next meeting of the Association in Armagh.

On the motion of the Chairman, seconded by Mr. Dawson, supported by Mr. Thompson, Prof. Dewar was unanimously elected an Honorary Associate of the Association.

Prof. DEWAR returned his thanks and moved a hearty vote of thanks to the Chairman, which was passed by acclamation.

J. A. JORDAN, Hon. Sec.

NORTH WALES VETERINARY SOCIETY.

A meeting was held at the Eifl Hotel, Pwllheli, on Tuesday, March 29th. The following members were present: Messrs. R. S. Rowlands, President; R. Jones, Treasurer; G. Jones Roberts, Vice-President; J. Howard-Jones, J. R. Rigby, and L. W. Wynn Lloyd, Hon. Sec.

SUPPURATIVE PROCESSES WITHIN THE HOOF.

By J. R. RIGBY, M.R.C.V.S.

In choosing this subject to bring before the meeting, I have been influenced in great measure by the frequency with which we meet the condition in daily practice. Moreover, the diversity of its causes, the pathological alterations which it induces, and the varying gravity of its consequences invest it with considerable interest.

Suppuration within the hoof is the result of inflammation complicated by infection with pyogenic organisms. In this region the condition is rendered more serious by the fact that, on account of its imprisonment by the horny covering of the foot, the pus formed exerts pressure on the sensitive tissues within, causing great pain and tending to produce necrosis. Unless an outlet be made by removal of a part of the overlying horn, the pus follows the line of least resistance, and making its way along the sensitive laminæ escapes by forcing apart the coronary band and the wall of the hoof.

The inflammatory process giving rise to suppuration is generally traumatic in its origin and associated with a breach of continuity of horn structure, and the pus formed may be of two kinds, depending on the site of injury. If merely the superficial portion of the horn-secreting structure has suffered, the resultant pus consists mainly of broken down horn cells. This horn pus is greasy in appearance and greyish or black in colour; it tends to confine itself to the surface of the soft tissues and to escape either by way of the coronet or at the heel without extending to deeper parts. When the deeper portions of the podophyllous membrane are injured, the pus formed is of the type seen in suppuration in other tissues—of creamy consistency and whitish yellow in colour. Naturally the latter condition is the more serious. Deep tissues are liable to be invaded by the inflammatory process and if pressure be not relieved necrssis may result, being favoured by the situation of the sensitive tissues between the wall of the foot and the pedal bone, and consequent interference with circulation.

This necrotic process may affect not only the soft tissues but often implicates the os pedis also. Apart from the necrosis pus may burrow into the pedal joint, or perforans sheath, or may produce purulent cellulitis of the sensitive frog. In such cases abscesses often form in the hollow of the heel and rupture of the perforans tendon may result.

Suppuration in the hoof often gives rise to an irritative fever, and septicæmia is a not infrequent complication of the condition, due to entrance of septic products into the circulation, this being favoured by the incompressibility of the pedal veins. Septicæmia is said to be more liable to occur in cases where necrosis of the pedal bone has taken place.

Other complications are laminitis from long continued standing in prolonged cases, or bed sores when the patient spends much of his time in the recumbent position.

The causes of hoof suppuration are many. Pricks in shoeing and gathered nails are perhaps the commonest, but the condition also arises from nail binds, corns, bruises, sand crack, injuries to the coronet, or any wound of the foot by which infection can take place. In horses at grass "gravel" is a frequent cause.

It is stated that pus formation in the hoof cannot occur without the presence of a wound by which infecting organisms can obtain entrance. In practice, however, we often meet with cases in which the most careful examination fails to reveal any breach of continuity of the horn. Such cases make one inclined to suspect that a bruise or other injury to the sensitive structures of the foot can become infected from the blood stream.

Diagnosis.—The presence of pus in the foot can generally be suspected from the animal's action. Lameness is most marked at the moment when weight comes on the affected foot, and this period is shortened as much as possible. The part of the hoof on which weight is placed often suggestive as to the actual site of pus; for example, when the mischief is near the heel the animal goes on his toe. This latter symptom is marked in cases where the perforans sheath is affected and in such cases extension of the pastern produces marked signs of pain.

Lameness is generally more pronounced on hard ground or stones and there may be swelling of the tissues above the hoof extending upwards for a varying distance. On making a closer examination heat can often be detected in the affected foot, either locally at the seat of injury, or all round the hoof. If unshod the foot should then be tapped with a light hammer both round the wall and over the sole and frog. Compression with the hoof testers or a pair of blacksmith's pincers is even more helpful in locating the exact spot for which we are looking, and especially does this apply to examination of the feet of young animals, when percussion is often of little use.

If no definite information is obtained by these means, a thin layer of horn may be removed from the sole with the drawing knife and indications sought of puncture or other injury. The frog, its cleft and commissures should also be cleaned up with the knife and examined in the same way.

If the animal is shod, the shoe should be removed and each nail examined as it is withdrawn for discoloration or moisture. The position of the nail holes at the ground surface should be noted, and also their points of exit on the wall.

If a nail is omitted the corresponding part of the hoof to that nail hole should receive special attention, in case the omitted nail has been found to be misdirected and has been "drawn." Suspicious nail holes should be explored with a fine searcher until we are satisfied either that they are clear of sensitive parts, or until the escape of moisture or pus indicates that we are in the right place.

If efforts in this direction are fruitless, attention must be directed to other parts of the foot, and anything suspicious, such as discolorations, cracks, or punctures in the sole or frog investigated with the knife. It often happens that although we feel convinced that there is pus in the hoof, we find absolutely nothing to indicate where infection has taken place. In such cases the

horn should be thinned over the part which seems most tender to pressure or percussion. There is little risk in removing the horn in a suspected spot until the sensitive foot is reached provided that cleanliness is observed afterwards, and I would, personally, prefer to cut down to blood rather than run the risk of leaving pus imprisoned in the hoof.

General Principles of Treatment.—The first thing to be done is to give exit to the enclosed products of suppuration and to flush out the cavity with a reliable antiseptic. Antiseptic baths are useful, and if the horse be made to put his weight on the limb while the foot is in the bath the fluid has a better chance of reaching every part of the injured tissue than if syringing alone be adopted. An antiseptic poultice may then be daily applied till lameness diminishes and the wound looks healthy, when the cavity may be packed up with tow soaked in an astringent lotion, and the foot enclosed in a boot or thick sack to exclude dirt.

In simple cases this may be all that is required, and recovery takes place in from four to ten days. The wound is then packed up with tar and tow, and the foot shod with a leather. In some cases, however, the animal remains very lame after pus has been evacuated while the wound seems to be doing well or indeed is almost healed. Such cases are troublesome, giving rise to suspicion of the suppurative process extending to deeper tissues, and thus leading to useless probing and exploration—useless, because in these cases the patient's irritable temperament seems to be responsible for the lameness persisting, although there is but little pain. It is often found that an animal which is very lame when the hoof is covered with sacking will go practically sound at once if the foot be placed in a boot with a metal or wooden plate in the bottom, so that weight is only borne by the crust of the hoof.

When pus formation takes place in the deeper layers of the foot treatment is less simple, and its results less assured. Not infrequently some of the sensitive laminæ are necrosed, and the injury or the subsequent inflammation has implicated the pedal bone. In such cases careful probing is necessary to see how far the injury extends, and the necrotic tissue must be scraped or removed. Healing may be delayed for some considerable time until a necrotic portion of bone becomes sufficiently detached to permit of its removal.

When inflammation is very severe the consequent swelling often leads to protrusion of the soft parts through the opening in the horn, causing great pain and favouring the imprisonment of pus. Poulticing usually aggravates the condition by causing further softening and increased swelling. It is better to apply an astringent to the protruding part and cover with a pressure dressing. The wound must be dressed daily till it appears healthy, discharge ceases, and lameness has largely or wholly disappeared. The shoe may then be replaced with tow and a leather, as in the previous case.

The foregoing is a rough outline of the symptoms and treatment of suppuration in the hoof. I now propose to discuss briefly a few of its causes and the conditions to which they give rise.

"*Nail-bind*" is due to one or more nails being driven too near the sensitive tissues of the foot, thus causing pressure. The shoe may be at fault, the nail holes being too coarse; or the smith—the nails having been carelessly driven. Pressure on the sensitive parts causes pain and lameness, which, however, is not excessive, the animal going short and guardedly. There may be considerable effusion, but suppuration is only likely to occur when the part has been pared out and cleanliness has not subsequently been observed. Removal of the shoe and poulticing for 24 hours is, as a rule, sufficient to bring about recovery.

Pricks.—When a nail is so deflected from its course as to actually pierce sensitive tissues the horse is said to be "pricked." The injury may be slight, the tissues being just grazed, or severe when they are deeply pierced. A slight prick may not cause lameness for some days, or, on the other hand, the animal may go lame at once. What takes place depends largely on the condition of the offending nail. If clean, only slight temporary lameness may be caused and recovery takes place rapidly on its removal. But if infected, as is generally the case, the condition is more serious and suppuration ensues. In many cases we are not called until a large portion of the sole is under-run with pus, and in such cases the parts must be probed and care taken that such an opening is made as will prevent retention of any septic material. Otherwise, treatment follows the general principles already outlined, viz., antiseptic baths or poultices followed by pressure dressings until ready for shoeing.

Prognosis is governed by the direction and extent of the wound, the amount of constitutional disturbance, the degree of pain and the duration of acute symptoms after the pus is afforded outlet.

Wounds in the Foot.—Of various kinds; gathered nails, injuries by stepping on the clip of a cast shoe, cuts by glass, sharp stones, pieces of iron or slate, etc.

Either sole or frog may be the seat of the injury. Wounds by the clip generally occur in the anterior portion of the sole. Glass or stones may penetrate anywhere. Nails usually enter the frog or its commissures between the frog and sole. The point of entrance has an important bearing on the gravity of the case, the most dangerous point being about the middle of the frog, directly beneath the navicular bone and perforans tendon. Nails entering the point of the frog may injure the lower surface of the pedal bone, and while the condition is a serious one it is not so grave as injury to the tendon sheath.

Treatment depends on the time which has elapsed since the injury occurred. If called at once it may be sufficient to slightly thin the horn round the wound so as to give free drainage, and then direct our efforts to the prevention of further infection by well washing the part with an antiseptic and covering with a dressing to exclude dirt. If the puncture is near the frog it may be slightly enlarged and treated as above, but if pain increases in the course of the next day or two the wound should be enlarged, carefully probed, and pressure applied to the frog with the fingers to see the nature of the discharge. If it is a frothy fluid, penetration of the synovial sheath is indicated. The wound must then be enlarged so as to allow of the introduction of an antiseptic to its furthest limits. The puncture should then be lightly stopped and protected by a packing of tow and a bandage or boot. The dressing should be repeated daily, and provided that swelling does not take place in the hollow of the heel one should not lose patience; but alteration of the discharge to a thick purulent material, and swelling above the bulbs of the heel indicate extension of the inflammatory process, and abscess formation in the hollow of the pastern will probably follow. The only hope of success then lies in stripping the horny frog and dissecting back the fibro-fatty frog until the deeper parts below are exposed. Diseased tissues are then scraped, necrotic pieces removed, and the part packed up with antiseptic dressings, the dressings being repeated daily.

Corns.—A corn is the result of bruising of the sensitive sole between the bar and wall of the hoof. In the first stages there is, as a rule, nothing more than a little extravasation of blood which stains the overlying horn; but repeated bruising leads to inflammation and serous exudation without any formation of pus. Infection is generally the result of injudicious paring and admission of pus forming organisms from without. The pus lies between the sensitive laminæ of the bars and quarter, and from here may extend under the horny sole and in

other directions. Frequently it makes its way upwards to force its way out at the coronet, and in its course may lead to infection and necrosis of the lateral cartilages, with quittor as a result.

Treatment consists in providing a good outlet for pus at the solar surface and thoroughly disinfecting. If the pedal bone is affected it may be necessary to curette and remove damaged tissue.

Quittor is a chronic purulent inflammation of the lateral cartilages and of surrounding structures, associated with necrosis and the formation of sinuses. It is one of the most serious forms of suppuration within the hoof. The condition is due to infection of the connective tissue of the lateral cartilage with pyogenic organism and consequent necrosis of the cartilage. Owing to the difficulty of securing dependent drainage and effecting removal of necrotic tissue, suppuration in this region is obstinate, and secondary abscesses and sinuses result. Extension may take place from the point of origin to other parts of the foot, and the process may invade the pedal joint, or produce purulent inflammation of the fibro-fatty frog, or sub-coronary connective tissue. Quittor is usually a sequel to suppurating corn or pricked foot. Pus accumulates and escapes at the coronet; the wound then heals for a time until a secondary abscess forms and breaks, the process being repeated indefinitely.

In other cases it results from tread or other injury to the coronet, with subsequent necrosis and extension downwards into other tissues of the foot, but this rarely takes place if the injury receives early attention.

Treatment is generally tedious, and a description of it would extend to too great length to permit me to deal with it.

On the proposition of the Hon. Sec., seconded by Mr. Jones Roberts, the discussion was postponed until the annual meeting.

A vote of thanks to the essayist, proposed by the President, seconded by the Vice-President, terminated the meeting.

L. W. Wynn Lloyd, Hon. Sec.

EPIZOOTIC ABORTION IN CATTLE.

We take the following from the Report of the Royal Commission on Epizootic Abortion in Cattle:—

"It now remains for us to state what are our own conclusions regarding the advisability of dealing with epizootic abortion of cattle under the Diseases of Animals Acts. And in the first place it may be well to set out the following points regarding the nature of the disease:

(1) Essentially the disease is an inflammation of the pregnant womb and of the membranes which surround the fœtus.

(2) The cause of the inflammation is a particular microbe or bacterium which multiplies within the womb and by so doing causes more or less extensive disorganisation of the connection between the mother and the fœtus, with in most cases abortion or premature expulsion of the fœtus as a result.

(3) In all probability this microbe does not in any natural circumstance multiply outside the bodies of infected animals, although when it escapes from the womb of such animals it may for a considerable period retain its vitality and hence its power of infecting healthy pregnant cows. The same statement may be differently expressed by saying that the disease is a purely contagious one—that no case of it can arise in the absence of direct or indirect contact with an antecedent case.

(4) The usual vehicle of contagion—the material in which the bacilli are contained—is the discharge which escapes from an infected cow during the act of abortion and for a varying time afterwards.

(5) Such infective material may gain direct admission into the genital passage of a pregnant cow, but probably as a rule it is swallowed and the bacilli reach the womb indirectly from the alimentary canal.

(6) The disease is not accompanied by any serious constitutional disturbance, and with the exception of the act of abortion itself, epizootic abortion cannot be said to have any pronounced or characteristic symptoms.

(7) The disease has already established a very serious hold on the cattle stock in this country, and it is constantly being spread to new herds by the sale of infected cows. In this dispersal of the seeds of the disease it is possible that the principal part is played by cows that change hands soon after they have aborted, but a share in the spread of the disease, and possibly even the larger share, must be laid to the charge of cows that are infected but still pregnant and apparently healthy at the time when they are sold and introduced into healthy herds.

The foregoing are the principal facts which must be kept in view in considering the possible methods by which the disease might be combated. These methods fall under two heads: (1) private effort and (2) public control.

Private Effort.—It cannot be denied that some owners succeed over long periods in keeping their herds free from this disease. In some cases chance, more than foresight, appears responsible for this result—the owner has been lucky enough never to purchase an infected animal. In other cases the herd has been kept healthy because it has been mainly self-supporting, only a few animals being purchased from time to time to recruit it, and these purchases being made only from herds known to be free from the disease.

It is obvious, however, that in the ordinary circumstances in which the cattle trade of this country is conducted, breeding or milking herds must as a rule be recruited by the purchase of cows or heifers without any real assurance that they have not been exposed to the risk of contagion, and in the absence of such an assurance the purchaser has no safeguard, since infected animals display no symptom by which their dangerous characters can be recognised. Broadly speaking, therefore, private effort alone is foredoomed to failure as a means of preventing the spread of epizootic abortion. And in this connection we may say that we cannot accept the suggestion that the existing state of affairs would be sensibly ameliorated if farmers were better informed regarding the pathology of the disease. We feel bound to accept the view put before us by the majority of the witnesses, that the fundamental fact concerning the disease—its contagious nature—is now very generally known to stockowners. Sinister evidence of this is furnished by the too common practice of immediately selling a cow that has aborted, and of exposing her for sale together with a calf falsely represented to be her own.

Public Control.—Public or State intervention with a view to prevention of a contagious disease appears to be justified when—

(*a*) It is recognised that private or individual effort as a means of combating the disease is from the nature of the case inadequate;

(*b*) Knowledge regarding the disease has reached such a point that it is possible to devise regulations which are likely to prove effectual if enforced by law;

(*c*) The weight of opinion amongst those whose interests are affected by the disease is in favour of State control;

(*d*) The loss occasioned by the disease when uncontrolled exceeds the probable cost of the measures required to counteract it.

We have already given reasons for thinking that private effort is incapable of coping with epizootic abortion.

DISEASES OF ANIMALS ACTS 1894 TO 1903, SUMMARY OF RETURNS.

Period	Anthrax.		Foot-and-Mouth Disease.		Glanders (including Farcy)		Counties Affected	Sheep Scab.	Swine Fever.	
	Out-breaks	Ani-mals.	Out-breaks	Ani-mals.	Out-breaks	Ani-mals.	Animals Attacked	Out-breaks	Out-breaks.	Slaughtered. *
GT. BRITAIN. Week ended Aug. 27	21	22	...	...	7	18		4	29	146
Corresponding week in 1909 ...	18	34			9	17		1	23	206
Corresponding week in 1908 ...	16	18			21	41	Essex 6	1	19	417
Corresponding week in 1907 ...	16	26			18	35	Kent 1	4	44	108
Total for 35 weeks, 1910	999	1206	2	15	255	776	London 10 Lanark 1	339	1000	8858
Corresponding period in 1909 ...	905	1211			375	1360		471	1249	10995
Corresponding period in 1908 ...	758	1013	3	112	566	1783		637	1471	8500
Corresponding period in 1907 ...	750	992			628	1440		416	1823	8495

Board of Agriculture and Fisheries, Aug. 30, 1910.

							Parasitic Mange (outbreaks)			
IRELAND. Week ended Aug. 20	...	...	...	...	...	...	4	2	...	20
Corresponding Week in 1909 ...	...	...	...	...	...	...	...	...	2	122
Corresponding Week in 1908 ...	1	1	...	...	...	...	...	...	3	17
Corresponding Week in 1907 ...	...	...	...	...	...	...	2	...	5	44
Total for 34 weeks, 1910 ...	5	8	...	...	1	2	52	347	71	1698
Corresponding period in 1909 ...	5	5	...	...	...	...	63	305	82	1467
Corresponding period in 1908 ...	6	9	...	...	...	...	31	272	130	2749
Corresponding period in 1907 ...	1	3	...	...	4	8	62	189	98	1587

Department of Agriculture and Technical Instruction for Ireland, (Veterinary Branch), Dublin, Aug. 24. 1910

NOTE.—The figures for the Current Year are approximate only. * As Diseased or Exposed to Infection

Individual owners here and there are able to keep their herds clean, but the majority are constantly exposed to the risk which attaches to the present unrestrained sale of cows that have actually aborted or come from infected herds.

We also think that the second and third of the above conditions necessary to justify State intervention exist in the case of epizootic abortion. The cause of the disease is now definitely known, and the difficulty of diagnosis would probably not be greater than it is in the case of some of the diseases already dealt with under the Diseases of Animals Acts. So far, therefore, as the question of diagnosis is concerned, it would appear to be quite practicable to compel notification of cases of abortion, and to arrive at a conclusive diagnosis as to the existence or otherwise of the disease in a contagious form.

As a complementary measure it would be necessary to prohibit for a time the free sale or movement of cows that have recently aborted. It is scarcely possible to doubt that this would have an important effect in preventing the further dissemination of the disease, but it would furnish only the minimum protection which the owners of healthy herds might reasonably expect, for there would still remain the risk attaching to the sale of in-contact pregnant cows from infected herds. Although it is not at present possible to say what part is played by the sale of infected but apparently healthy pregnant cows in the dissemination of the disease throughout the country, it is scarcely permissible to hope that it is a negligible part, or to expect that the disease could be stamped out by restrictions imposed only on cows that have actually aborted.

Under a plan of campaign which aimed at the early eradication of epizootic abortion it would certainly be necessary to place restrictions on the pregnant animals known to have been exposed to risk of infection as well as on the cows that have actually aborted, but we do not think it would be advisable to attempt to deal with the disease in that way at the outset. At first the admittedly less effective plan of placing restrictions only on the sale and movement of cows that have aborted would appear to be preferable, because the more drastic method would in many cases involve a heavy loss on the owners of infected herds, and probably would not receive the hearty support of owners in general. On the other hand, the evidence laid before us leads us to think that compulsory notification, and enforced temporary isolation of cows that have aborted, would be viewed with approval by the majority of the stock-owners.

In order to decide whether any reported case of premature calving had been the result of infection or not, notification would have to be followed by a veterinary inquiry on behalf of the Local Authority for the purposes of the Diseases of Animals Acts. We do not, however, think that such inquiry need be repeated in the event of further cases of abortion occurring on premises upon which the disease has been found upon veterinary inquiry to exist within a period of less than three months from the date of the last reported case of premature calving, since it would be justifiable to infer that the later cases were due to contagion. It would, however, be open to the owner to produce satisfactory veterinary evidence that such was not the case, and thus to secure the withdrawal of the restrictions affecting such animals.

Such an arrangement would sensibly curtail the number of veterinary inquiries to be made on behalf of the Local Authority, and would materially reduce the

cost of enforcing such restrictions as those we suggest for adoption, without inflicting any undue hardship on the stock-owner. All that would be necessary would then be that a period should be fixed during which cases of premature calving occurring on infected premises should be regarded as cases of epizootic abortion without further veterinary inquiry on behalf of the Local Authority. Such period can only be fixed tentatively, but we are of opinion that after a lapse of three months from the last case of abortion on any premises the presumption that any subsequent case of abortion was due to infection should not be maintained.

Lastly, we believe that these measures would be justified from an economic point of view. The annual loss of which epizootic abortion is now the cause must be enormous, and it appears to be certain that if the disease is allowed to run an uncontrolled course, as at present, it will become a still more serious plague.

RECOMMENDATIONS.

We, therefore, recommend that, as a preliminary measure, epizootic abortion in cattle should be dealt with under an Order of the Board of Agriculture and Fisheries requiring :—

(1) Compulsory notification of suspected cases of the disease :
(2) Veterinary inquiry to establish the existence of disease on any particular premises : and
(3) Temporary isolation and restrictions on the movement of any cow that has recently aborted.

We also consider that in the event of effect being given to the above recommendations, such measures as may be thought necessary should be taken to avert the possible introduction of infection in cows imported into Great Britain from Ireland, the Channel Islands, or the Isle of Man.

THE ROYAL SANITARY INSTITUTE.

BRIGHTON CONGRESS, SEPTEMBER 5TH TO 10TH.

Preventive Medicine Section. President : Dr. Hope, of Liverpool. The economic effect of Hygiene on the wage earning capacity of the people will be discussed. Infectious disease in connection with railway travelling and several subjects relative to the Administration of Schools will also be dealt with.

Engineering and Architectural Sections. President : Mr. Henry Rofe, M. Inst., C.E. The influence of subsoil waters on health will be introduced by Mr. Baldwin Latham, and several aspects of school planning, municipal baths and washhouses, and fever hospital construction will come under consideration.

Conference of Municipal Representatives, presided over by the Mayor of Brighton, will discuss the Notification of Births Acts and the difficulties presented by the recent legislation with regard to midwives. The most effective and economical means by which Municipal Authorities can provide sanatoria and treatment for the poorer members of the community will be considered.

Conference of Port Sanitary Authorities, presided over by Mr. Williamson, Port of London, will consider the disinfection of ships in relation to the introduction of Plague and Cholera. The ventilation of ships and the improvement of accommodation for the crews will also be considered.

Conference of Medical Officers of Health. Dr. Sergeant, of Lancashire County Council, President. The Registration of Schools not controlled by the Board of Education : Administrative measures in controlling milk supplies during outbreaks of sickness in cows.

Veterinary Inspectors Conference. President : Mr. W. Hunting. The transmission of scarlet fever and diphtheria from animal to man.

The Sanitary Inspectors will have before them several question relating to the storage and inspection of food stuffs.

The Women's Section under the presidentship of the Countess of Chichester, will devote attention chiefly to papers on the feeding of infants and the teaching of practical hygiene in the home. In the Childhood Section, under Sir William Collins, many aspects of child life will be considered. The Physical training of girls, and the treatment of ringworm by X-rays are also included.

The recent Housing and Town Planning Act, sewage treatment, the development of roads for motor traffic, and other matters will be brought forward.

Popular lectures will be given by Dr. Alex. Hill, late Master of Downing College, on "The Bricks with which the Body is built," and by Dr. Arthur Newsholme, Principal Medical Officer of the Local Government Board, on "The National importance of child mortality.'

E. WHITE WALLIS, Secretary.

90 Buckingham Palace Road.

Cruelty Charge at Folkestone.—Dismissed.

On Wednesday the 24th inst., before Alderman Spurgeon (in the chair) and Alderman Vaughan, David Burden was summoned for cruelty to a horse by working it in an unfit state on August 15th. He pleaded not guilty.

Inspector Langdon, R.S.P.C.A., stationed at Folkestone, said at 11 a.m. on Monday, August 15th, he saw the defendant driving at a trot a bay gelding attached to a four-wheeled van. Noticing the animal was going lame, he stopped the defendant and said to him, "Your horse is lame." He replied, "He always goes a bit stiff." He then examined the animal, and found it to be aged and in fair condition. On the off hind hock there was a spavin, and the parts were inflamed and painful when touched. The animal was in pain when standing, for it rested the limb. He told the defendant the horse was lame and not fit to be worked. He replied, "I have had the horse about ten weeks. It has always been stiff on the hock joint, and I have bathed it with hot water." At witness's suggestion the defendant took the horse out and did not work it. On Thursday, the 18th, he saw the defendant leading the horse, and, in reply to a question, defendant said, "I have had it seen by a veterinary surgeon, who has told me the animal is unfit for work, and he has advised me to turn if out."

Insp. Adams said on Tuesday, the 16th, the previous withness showed him the bay gelding in the presence of the defendant, who brought it out of the stable. It was very lame on the off hind leg, and had a deposit on the hock. There was considerable heat in it, and the spavin was high up on the limb. As it walked it was plain to be seen that it was lame. He told the defendant that it was quite unfit to work. There was a wastage of the muscles above the hock.

For the defence, Mr. H. B. Eve, veterinary surgeon, said he examined the bay gelding on the 22nd, in a field at Cheriton. He had it walked on the road. He found it was an aged bay gelding, about 15 years old, it was obviously lame in the region of the hock, from a bone spavin, which was of old standing. So extensive was the growth that it interfered with the movement of the joint, which accounted for the peculiar stiffness the cob manifested during the act of locomotion, even to walk. In his opinion the lameness was permanent, but of a mechanical nature. There was no pain to the animal when it went at a walk, provided it was not overloaded. He would not consider it an act of cruelty to allow the animal to pull a light four-wheeled trolly at a walk, but in his opinion it was unfit to trot. It was, however, not unfit for the work it was doing.

Cross-examined, Mr. Eve said it was quite likely that another veterinary surgeon would say the horse was unfit for work. The cob had no doubt had an injury to the hip bone, and it showed marks of having been blistered, which accounted for the wasting of the quarter. He was prepared to pay the expenses of the horse and the value of it if it was sent to the Royal College of Veterinary Surgeons and it was then found that his statement with regard to it was not correct.

Mr. L. Eady, assistant to Mr. Eve, also gave evidence, practically corroborating that given by the previous witness.

Mr. J. E. Miller, veterinary surgeon, of Canterbury, said on August 23rd he proceeded to Mr. Burden's premises and examined the bay gelding. It was lame on the off hind leg in the region of the hock, which was very much enlarged, but which was quite cold and had no heat whatever in it. In the off hind hip there was a slight wastage of the muscles, and it looked as if it had been branded or blistered at some time. He had the animal walked, and it showed stiffness at the particular region of the hock, and as it walked the stiffness wore off. He also had the animal trotted, when the stiffness was worse. It was a permanent lameness, and he should say the spavin and been formed at least 12 or 15 months. The animal was quite workable at a walk. In his opinion the horse would not be in any pain on the day it was walked, because the stiffness was of old standing.

The Bench inspected the horse, which was outside the Court, and on their return Alderman Spurgen said the Court thought the Society ought to have had a veterinary surgeon. They had had the evidence of three veterinary surgeons on the other side, so, as there was so much doubt about the matter, they had no alternative but to dismiss the case.

On the application of the Inspector, the Magistrates remitted the costs.

Leucoderma and Palæogenesis.

To the Editor of the British Medical Journal.

Sir,—In *The British Medical Journal* of April 23, Sir Jonathan Hutchinson explains the dappled skin of leucoderma as a revelation of a pigment pattern pre-existing in the skin. Dr. Renshaw, in the issue of July 30th, states "the curious motted appearance may well be accepted as atavistic ; but the complete truth appears to be much more wonderful than that."

Since Darwin's time atavism has been made a sort of dust heap upon which all morphological phenomena which cannot be satisfactorily explained are thrust.

This explanation, pretty as it may be, is purely hypothetical, and brings us no nearer to the causation of vitiligo or leucoderma.

If the pathology of vitiligo is carefully studied it will be noticed that there are marked inflammatory changes in the corium.

Clinically vitiligo and alopecia areata are not uncommonly associated, and several cases are on record where leucoderma preceded a dermatitis atrophicans ; in fact, the inflammatory changes seen in a very early stage of skin atrophy are indistinguishable from those found both in vitiligo and alopecia areata.

There can be no doubt that these three diseases are due to some toxæmia, the nature of which we shall remain in the dark about until chemistry comes to fill the gaps which bacteriology cannot.

That vitiligo is of inflammatory nature is amply proved by the appearance of areas of leucoderma on a disappearing macular-syphilitic rash—the so-called leucoderma syphiliticum, a most useful diagnostic sign, especially in women, in whom the neck and anterior folds of the axillæ become generally involved.

A depigmented area takes the place of the macule, and as it is not uncommon for a papule to develop in the centre of a macule, a hyperpigmented spot marks where it has been.

Inflammation, then, on the one hand causes a disappearance of the pigment and on the other an increase thereof.

Many assert that hyperpigmentation precedes leucoderma, but whether this is so or not is extremely difficult to say.

The pigment concerned is that found in the lowest layers of rhe epidermis—it is a melanin but not derived from the blood ; on the contrary, it is manufactured by the epidermal cells themselves, and depends upon ferment action. Vitiligo must be regarded as a sign of toxæmia, probably caused by various toxins, some of which produce an inhibitory effect on the ferment action of the rete cells—leucoderma, some a stimulating —chloasma.

The change in the winter coat of animals has been explained by the phagocytic action of certain cells on the pigment. We know that the skin is being continually shed ; there is a gradual transformation going on from the prickle cells of the Malpighian layer to the horny cells in the stratum corneum ; what becomes, then, of the pigment in its upward progression ? There is no evidence that it recedes to be digested by cells in the corium, but everything in favour of a chemical change and transformatian into eleidin ; therefore seasonal variation can be explained by a chemical alteration in the pigment formed, and an inability of the cells to produce more owing to the ferment action being inhibited by the change of temperature, etc. In some animals seasonal variation is due to a disappearance of certain structures. For instance, the lesser black-headed gull which frequents the Thames by London annually has when he visits us a white head caused by a falling off of the black tips of the white feathers, and these are not reproduced until after the moulting season.—I am, etc.,

J. E. R. McDonagh, F.R.C.S.

Harley St., W.

Granulation Tissue.

Clementi finds by a long series of experiments that granulation tissue is an absolute barrier to the progress of septic germs, acting as an impassible filter, but that their frequency and rapid growth in the neighbourhood of granulation tissue impair its vigour and efficiency as such.—*La Sperimentale.*

Sale of Impotent Stallion.

A horse showed no abnormality of the generative organs, and was sold for stud purposes by the owner, and held a certificate from a veterinary officer inspecting stud horses, but was found useless as a stud animal by the purchaser. The court annulled the sale.—*Presse Vétérinaire.*

Yohimbin as a Milk Forcer.

Kronacher experimented by giving to some cows 0·10 grm. of Yohimbin in their food morning and evening, he found that it excited the action of the udder and increased the flow of milk ; that it is harmless in the early stages of pregnancy and useful in chronic metritis, restoring the function of the organ, and that it can be tolerated for a long period.—*La Clin. Vet.*

Schmidt's Injection for Mastitis.

250 grammes each of Alcohol and Glycerine with 85 grammes of physiological solution to be injected into the affected quarter, which should not be milked for three days. In severe cases life will be saved even if the function of the gland is lost.—*Ber. Woch.*

Tuesday's *Gazette* publishes an Order of the Board of Agriculture revoking as from Aug. 29 the Yorkshire (Foot-and-Mouth Disease) Orders of 1910 (Nos. 3, 4, and 5).

ARMY VETERINARY SERVICE.

Extract from *London Gazette*,
WAR OFFICE, WHITEHALL, Aug. 26.

ARMY VETERINARY CORPS.

Lieut. E. C. Russell to be Capt. Dated March 7.

The undermentioned Lieuts. to be Capts.: L. Danels, A. C. Anderson, W. J. Dale, J. R. Hodgkins, W. H. Simpson. Dated Aug. 26.

Capt. Robert Coulson Moore died at Ambala, India on 31st August from heart failure. This officer graduated in December, 1894. Was appointed Lieutenant Dec. 8th, 1897, and promoted Captain Oct. 5th. 1903. He served with the Tibet Expedition 1903-4 for which he received the medal and clasp, and was mentioned in despatches in the *London Gazette*, Dec. 13th, 1904.

EXAMINATIONS FOR PROMOTION LIEUTENANTS OF THE TERRITORIAL FORCE. ARMY VETERINARY CORPS. —B. 16.

(Time allowed, 3 hours: Total marks 200).

1. You diagnose a case of glanders in camp in a unit of which you are in veterinary charge. What are your duties? (50 marks)
2. What are the measures you would recomend to the Officer Commanding a unit, for the disinfection of a stable from which cases of sarcoptic mange had been removed? (50 marks).
3. Several cases of heelrope galls having occurred in a unit, on its first going into camp, what steps would you take to remedy this? (50 marks).
4. What is the veterinary equipment alloted for the annual training of a mounted unit of the Territorial Force, and how is the issue arranged for? (25 marks).
5. How would you arrange for the disposal in camp of carcases of horses dead or destroyed under the following conditions?—
   (1) Contagious Diseases (Animals) Order.
   (2) Other causes. (25 marks).

CORRESPONDENCE.

THE BRIGHTON CONGRESS.

Dear Sir,

Please allow me through the medium of your journal to call the attention of veterinary surgeons to the above, and to invite them to attend as fully as possible not only the Conference of Veterinary Inspectors on the 9th, but the larger sectional meetings on the 6th and 7th, and also the Conference of Medical Officers of Health on the 8th, at all of which they will find subjects of interest under discussion.

I think it is no exaggeration to say that our standing as Public Health officers is considerably influenced by our attendance at these congresses, and that by our participation in the deliberations of the sections more good can be done for the profession than by the more limited conference.

The Conference of Veterinary Inspectors is open to all members of the veterinary profession, and will be held in the North Drawing Room of the Royal Pavilion at 10 a.m. on Friday, September 9th, and in order to avoid disappointment, may I remind gentlemen who intend to be present of the regulation regarding resolutions, viz.: "No resolution can be proposed at any of the sections or conferences, unless sent to the Secretary of the Section or Conference in time for approval and insertion in the programme for the day on which it is to be proposed." —Yours faithfully,

JAMES A. DIXON, Recording Secretary of the Conference of Veterinary Inspectors.

August 29.

THE FUTURE OF THE PROFESSION.

Sir,

Your correspondent, "Honoris Causa" attributes the farmer's home doctoring of his animals to two causes, the County Councils and the instrument makers.

As one of the people employed by two County Councils to lecture on Veterinary Science, my experience of the effect of such lectures has been varied—one good class tenant farmer confessed that he knew less at the end of the course than he did at the beginning, and I quite agreed with him, because he was one of the many who *thought* he knew all about the ailments of farm stock, and his attendance at the lectures had shown him how ignorant he was, at least, of the names, situations, and functions of the various organs in the animals' bodies. Others, as a result of their attendance have been able to render valuable "first aid" to their cows in a simple mal-presentation of the fœtus. The usual prescriptions written on the blackboard at the lectures can be found in most books on horses and stables; at the same time, the indiscriminate use of proprietary veterinary medicines by owners is discouraged as much as possible.

I have found that the teaching of elementary anatomy and physiology, the exhibition of lantern slides, and the models of teeth showing the various ages of the horse, together with a "popular" lecture on anthrax and tuberculosis to be the best available means which the qualified man has at his disposal which enables him to educate the stockowner and indirectly disabuse his (the stockowner's) mind of the infallibility of proprietary medicines, and it also exposes the narrow limitations of the so-called *unqualified veterinary surgeon*.

In course of time the qualified man is looked up to, and the possession of the diploma stamps the possessor, locally, as a man of superior knowledge in veterinary matters. I am writing from practical experience, and opine if a qualified man, whether he is a recent grraduate or not, knows his work, and is a worker, there is a fair outlook for him in any agricultural district in Great Britain.

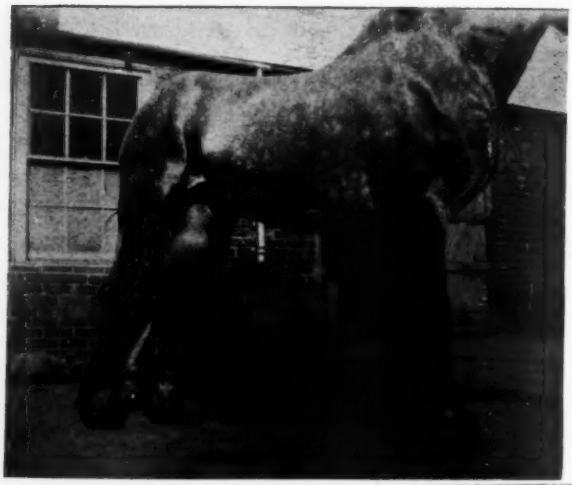
The stockowner without knowledge is usually the last person to appreciate a qualified man's efforts: the stockowner with knowledge generally makes a good nurse, and does not object to paying a fair fee for veterinary attendance and medicines.—Yours, etc.,

F.R.C.V.S.

THE MEAT INDUSTRY AND MEAT INSPECTION, by Prof. Gerald Leighton and Loudon M. Douglas. 4to., 5 vols., £4 17s. 6d. The Educational Book Co. Ltd., 210 Temple Chambers, London, E.C.

COMMUNICATIONS AND PAPERS RECEIVED:—Lt. E. C. Russell, Messrs. A. Johns, J. A. Jordan, E. Morgan. F.R.C.V.S.

Cambrian News.



Before operation.
Off side.

Before operation.
Near side.

Six weeks
after operation.

Operation for Hernia:
E. C. Russell, Lieut. A.V.C.